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IN THE CLAIMS:

38. (Currently Amended) A method for providing high connectivity communications over an optical ring network operating in photonic time slots, comprising the steps of:

generating a set of serial packets by a tunable laser, where each packet in said set is at a different wavelength and occupies a time slot of said time slots;

stacking said set of serial packets to form a first composite packet to superimpose said packets within a time slot of said time slots to form a first composite packet by a stacker;

performing a serial-to-parallel conversion process such that said first composite packet is in a single photonic time slot;

flipping an optical crossbar switch connecting a core optical ring to said stacker to a cross state;

adding employing an optical crossbar switch of a first node of a core ring of said ring network to add said first composite packet into an empty time slot of a core ring of said network to said core optical ring via said optical crossbar switch such that said first composite packet

dropping said first composite packet as a unit in a second node of said core ring of said ring network which second node is a destination node of said first composite packet,

propagates on said core optical ring for distribution to said first composite packet's destination;

at least one second composite packet propagating on said core optical ring for distribution to said second composite packet's destination;

locating said destination of said second composite packet;

dropping said second composite packet at said destination for said second composite packet;

serializing said second first composite packet at said second node by an unstacker into a received serial stream of packets; and

distributing at least one packet of said received serial stream of packets.

39. (Currently Amended) The method according to claim 38, further comprising a steps of:

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concurrently with the adding of said first composite packet, dropping a second composite packet from said core ring,

unstacking said second composite packet at said first node into a second received serial stream of packets; and

distributing at least one packet of said second received serial stream of packets,
~~wherein said unstacker performs a parallel-to-serial conversion process to form said serial stream of packets.~~

40. (Currently Amended) The method according to claim 39 ~~38~~, wherein said stacking is carried out by a stacker, and said unstacking is carried out by an unstacker
~~unstacker performs a demultiplexing process to form said serial stream of packets.~~

41. (Currently Amended) The method according to claim ~~40~~ 38, wherein said stacker and said unstacker form a single device by sharing some components
~~second composite packet passes a node of said core optical ring when said optical crossbar switch coupled to said node is in a bar state.~~

41. (Currently Amended) The method according to claim 38, wherein said first
~~second~~ composite packet arrives at said destination node by passing through an optical crossbar switch contained within each of N nodes of said core network, where $N \geq 0$
~~passes a node of said core optical ring when said optical crossbar switch coupled to said node is in a bar state.~~

42. (Currently Amended) The method according to claim 38, wherein said first
composite packet arrives at said destination node by passing through an optical crossbar switch contained within each of N nodes of said core network, where $N \geq 0$
~~stacker and said unstacker form a single device by sharing some components.~~

43. (Previously Presented) The method according to claim 38, wherein said stacking step entails a time delay.

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44. (Previously Presented) The method according to claim 38, wherein said serializing step entails a time delay.

45. (Currently Amended) The method according to claim 38, wherein said generating step generates a said set of serial packets, each packet at a different wavelength in a sequential manner.

46. (Currently Amended) The method according to claim 38, wherein said generating step generates a said set of serial packets, each packet at a different wavelength in an arbitrary sequence.

47. (Currently Amended) The method according to claim 40, wherein said demultiplexing process unstacking is performed by a WDM demultiplexer.

48. (Previously Presented) A method for providing high connectivity communications over an optical ring network comprising the steps of:

- generating a set of serial packets by a tunable laser;

- stacking said set of serial packets to form a first composite packet by said stacker;

- performing a serial-to-parallel conversion process such that said first composite packet is in a single photonic time slot;

- flipping an optical crossbar switch connecting a core optical ring to said stacker to a cross state;

- adding said first composite packet to said core optical ring via said optical crossbar switch such that said first composite packet propagates on said core optical ring for distribution to said first composite packet's destination;

- at least one second composite packet circulating around said core optical ring for distribution to said second composite packet's destination;

- locating said destination of said second composite packet;

- dropping said second composite packet at said destination for said second composite packet; and

- distributing said composite packet by wavelength.

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49. (Previously Presented) A method for accomplishing transparent bypass over a high connectivity communications optical ring network comprising the steps of:

determining that a first composite packet, propagating on a core optical ring, is to be dropped at a node of said core optical ring, said node having an optical crossbar switch, said optical crossbar switch further coupled to a subtending system such that said first composite packet is able to be further distributed on said subtending system;

flipping said optical crossbar switch into a bar state;

dropping said first composite packet via said flipped optical crossbar switch;

receiving by a first WDM of said first composite packet;

filtering and separating, by said first WDM wavelengths of parallel packets comprising said first composite packet, that are to be further distributed on said subtending system;

serializing said parallel packets;

further distributing said serialized packets;

forwarding wavelengths not destined for further distribution on said subtending system to a second WDM; and

outputting said wavelengths not destined for further distribution back onto said core optical ring in a vacant photonic time slot via said optical crossbar switch in said cross state.

50. (Previously Presented) The method according to claim 49, further comprising the steps of:

generating a serial stream of packets;

forming a second composite packet in a single photonic time slot from said serial stream of packets; and

interleaving said second composite packet with said wavelengths not destined for further distribution on said subtending system prior to outputting said wavelengths not destined for further distribution on said subtending system back onto said core optical ring.

51. (Previously Presented) A method for accomplishing transparent bypass over a high connectivity communications optical ring network comprising the steps of:

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dropping a first composite packet comprising a plurality of parallel packets at a node of a core optical ring via an optical crossbar switch in a cross state;

serializing and further distributing a first portion of said plurality of parallel packets; and

passing a second portion of said plurality of parallel packets through and outputting said second portion of said plurality of parallel packets back onto said core optical ring.

52. (Previously Presented) The method according to claim 51, wherein said serializing step is accomplished via a plurality of three - and four-port circulators and a plurality of fiber Bragg gratings (FBGs).

53. (Previously Presented) The method according to claim 52, wherein said passing step is accomplished via said plurality of three- and four-port circulators and said plurality of FBGs.

54. (Previously Presented) The method according to claim 51, further comprising the steps of:

creating a second composite packet to be added to said core optical ring; and

interleaving said second composite packet with said second portion of said plurality of parallel packets prior to said second portion of parallel packets being output onto said core optical ring.

55. (Previously Presented) A method for providing high connectivity communications over an optical ring network comprising the steps of:

generating a set of serial packets;

forming a first composite packet from said set of serial packets, said first composite packet being parallel packets in a single photonic time slot;

adding said first composite packet to a core optical ring in a vacant photonic time slot via an optical crossbar switch;

dropping a second composite packet propagating on said core optical ring at a node for further distribution via a subtending system; and

serializing said second composite packet dropped at said node.

56. (Previously Presented) The method according to claim 55, wherein said generating step is performed by a tunable laser.

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57. (Previously Presented) The method according to claim 55, further comprising the step of a providing enhanced services including packet formation, packet insertion, packet extraction and optical crossbar switch control via a control channel.

58. (Previously Presented) The method according to claim 57, wherein said control channel is out-of-band.

59. (Previously Presented) The method according to claim 55, wherein said forming step is performed serially.

60. (Previously Presented) The method according to claim 55, wherein said forming step is performed in parallel.

61. (Previously Presented) The method according to claim 55, wherein said serializing step is performed serially.

62. (Previously Presented) The method according to claim 55, wherein said serializing step is performed in parallel.

63. (Previously Presented) The method according to claim 55, wherein devices performing said forming step and said serializing step are both serial and share optical components.

64. (Previously Presented) The method according to claim 55, wherein devices performing said forming step and said serializing step are both parallel and share optical components.

65. (Previously Presented) The method according to claim 55, wherein a transparent bypass scheme accomplishes a bypass from switch output to switch input.

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66. (Previously Presented) The method according to claim 65, wherein a first portion of said second composite packet is distributed to a destination and a second portion of said second composite packet is routed back onto said core optical ring bypassing said stacker.

67. (Previously Presented) The method according to claim 66, wherein said second portion of said second composite packet is interleaved with a third composite packet created by said stacker.

68. (Previously Presented) The method according to claim 65, wherein a first portion of said second composite packet is distributed to a destination and a second portion of said composite packet is routed back onto said core optical ring by passing through said stacker.

69. (Previously Presented) The method according to claim 68, wherein said second portion of said second composite packet is interleaved with a third composite packet created by said stacker.

70. (Previously Presented) The method according to claim 55, wherein said node has optical output and said subtending system is driven optically by output of said optical crossbar switch.

71. (Previously Presented) The method according to claim 69, wherein said node further comprises transceivers to receive said optical output of said node and to retransmit said optical output said optical crossbar switch to said subtending system.